

of chemists now profess this belief without realising that the use of the historical method presupposes that the teacher has a grasp of history. Ostwald's dictum—"a most remarkable and praiseworthy thing in scientific literature is that almost every word is written conscientiously"—can hardly be applied to the usual treatment of the history of science. The historical conscience is somewhat blunt in the scientific man. In the present book, for instance, the statements are made that Lavoisier introduced the use of the balance into chemistry (p. 12), and that Dalton discovered the law of multiple proportion on consideration of marsh gas and olefiant gas, and then of carbon monoxide and dioxide, confirmed his discovery by the oxides of nitrogen, and then arrived at his atomic theory (p. 24). These statements are mere fiction.

In discussing solution, the author says nothing of the hydrate theory, and instead of pointing out that the theory of ions is extremely useful and extremely vulnerable, remarks that it can be regarded as one of the best-founded hypotheses of modern chemistry (p. 151). There is a curious statement on p. 40 to the effect that the practice of writing chemical formulæ, such as H_2SO_4 , instead of $H^+SO_4^-$, is more common in Germany than elsewhere.

(2) This book is evidently the outcome of a keen interest in the teaching of chemistry. It is intended to be used by first-year students at a university, in connection with a course of lectures on chemical theory. There are chapters (in addition to what is to be expected on molecular and atomic weights, the periodic system, &c.) on the theory of electrolytic dissociation, the law of mass action, the phase rule, and thermochemistry.

Surely it is a mistake in policy to state Avogadro's hypothesis and to proceed without a moment's delay to apply the hypothesis to prove that the molecule of oxygen can be halved (pp. 11-12). Again, it would be much better to omit the proof on pp. 47-48—not a very clear one—that the "molecular weight of a gas is equal to twice its density compared to hydrogen." Once the student realises that under similar conditions the molecular weights of different gases occupy the same volume, it is obvious to him if it is only pointed out that he can find the density of a gas relative to hydrogen by dividing the molecular weight of the gas by 2 (the molecular weight of hydrogen).

A. N. M.

OUR BOOK SHELF.

Malleable Cast Iron. By S. Jones Parsons. Pp. xi+171. (London: A. Constable and Co., Ltd., 1909.) Price 8s. net.

THAT malleable cast iron has been given a work to itself is an index of its growing importance in the world of iron and steel. The methods of its manufacture are so closely allied to the other parts of foundry work that it is doubtful whether it is not better dealt with in a general work on the foundry, where its special features may be pointed out in a section devoted to this subject.

The present work deals with the whole of the foundry aspects of malleable cast iron, melting, moulding, annealing, cleaning and straightening,

design, patterns, inspection and testing, supplementary processes such as galvanising, and applications. The practical part of the work seems well done and needs little comment, but it is very unfortunate for those who are endeavouring to promote the application of science in the foundry that the compositions given on p. 9, if such pigs could be procured, would yield disastrous results. This is particularly unfortunate as the number of what are called "practical men" seeking the assistance of science in the foundry is steadily increasing, and these men are very keen on the quest after they have proved its first benefit. Anything misleading which would give them a feeling of distrust should be avoided if possible.

The analyses on p. 9 show pig-irons with from 0.145 to 2.52 per cent. sulphur and 0.93 to 1.50 per cent. phosphorus as suitable for the manufacture of malleable cast iron, whereas good specimens of this material do not contain more than about 0.1 per cent. phosphorus.

The definition of shrinkage is not good, and the author fails to grasp the essential differences between the manufacture of Réaumur and Blackheart malleable iron. Many other points have been noted, such as "that theorists regard the pyrometer as indispensable, but in practice it is less trustworthy than the trained eye," &c. W. H. Hatfield, whom he praises, would tell the author that this statement is quite out of date. This work as a whole is untrustworthy so far as the science underlying the manufacture of malleable cast iron is concerned.

A. McW.

A Manual of Infectious Diseases. By Dr. E. W. Goodall and Dr. J. W. Washbourn, C.M.G. Second edition, revised and enlarged by Dr. E. W. Goodall. Pp. xii+426. (London: H. K. Lewis, 1908.) Price 14s. net.

THE second edition of this well-known book has been prepared by Dr. Goodall, who expresses the loss sustained by pathology and clinical medicine by the untimely death of Dr. Washbourn, which occurred since the first edition appeared.

Little but praise can be expressed for the work. The descriptions of the diseases dealt with, their symptomatology and treatment, are clearly and concisely stated, and the differential diagnoses are excellent. All recent work seems to be incorporated, and the pathology and bacteriology of the diseases are given so far as is known. Thus, under small-pox, we find descriptions of the *Cytoryctes variolae* of Guarnieri and of the intracellular bodies of Councilman, Calkins, and Tyzzer.

We think that in a few instances the arrangement of the subject-matter might with advantage have been altered, or at least cross-references inserted. For instance, dealing with the "dissemination" of enteric fever, the part played by "bacilli carriers" is just noted, this portion of the subject being elaborated later under "Protection and Duration of Infectivity." Similarly the presence of virulent diphtheria bacilli in "well" persons as a mode of spread of the disease might have been emphasised, and membranous rhinitis should have been more clearly referred to in the section on "nasal diphtheria." The reviser believes that an attack of enteric fever confers almost complete protection; in this he is at variance with other recognised authorities. "Slop" diet is advocated for enteric fever, rightly so, we think; but some mention ought to have been made of more generous dieting as advocated by some, particularly in prolonged cases.

The authors doubtless had to set some limitation on the number of diseases dealt with, but as chapters are devoted to relapsing and typhus fevers and

plague, diseases rarely seen in this country nowadays, we think that brief accounts of Mediterranean fever and cholera might have been included with advantage.

The book is profusely illustrated, and some of the photographs, though only in black and white, give a remarkably good idea of the characters and distribution of rashes.

R. T. H.

Beschrijving en Onderzoek van den gyroscopischen Horizon Fleuriais (Model Ponthus et Therrode).

By L. Roosenburg. Pp. 94; 3 plates. (Utrecht: Kemink & Zoon, 1909.)

IN this pamphlet the author describes some improvements introduced into the form of gyrostatic horizon proposed by Fleuriais. In the original construction, a top rotated in a chamber from which the air had been removed, and the whole could be fixed to a sextant in front of the horizon glass. Upon the top was placed a glass scale, with arrangements for reflecting the divisions of the scale into the sextant telescope in a direction parallel to the equator of the top. The angle subtended by the divisions of the scale was ten minutes, and the position of the object was estimated on this scale.

In the new form here described, a temporary vacuum only is made, and the chamber can be opened for the inspection of the parts, and renewal of the top point and the cup in which it rotates. The top is set in motion by an air-pump, which also creates the vacuum. Observations are possible for fifteen or twenty minutes. After the top has been rotating some six or seven minutes and the precessional effects rendered negligible, the sextant is clamped with the sun or star in the field of view, and a considerable number of readings taken of the position of the object on the scale. Lastly, the reading of the sextant is taken.

The author insists on the necessity of a large number of readings in order to get good results, apparently to eliminate the effect of irregular motion, which in unfavourable circumstances can amount to 13' in three seconds. It is contended that though practice with the instrument is necessary, it is not difficult to use, is, in fact, easily mastered, and is equally available for stars as the sun. The results of more than 200 observations are given, and, with a few exceptions, the errors of altitude are always less than 3'. The author concludes that it is a trustworthy and very serviceable instrument for the determination of position at sea, preferable to other forms of the same class.

Revue de Géographie annuelle. Publiée sous la Direction de M. Ch. Vélain. Tome ii., Année 1908. Pp. 730. (Paris: Ch. Delagrave.) Price 15 francs.

THIS volume of the "Revue" ranges no less widely than the preceding one. As regional geography we find classified "Étude analytique du Relief de la Corse," by J. Deprat, and "Le Pérou," by C. Guibeaud. In the mathematical department G. Perrier deals with the figure of the earth and important geodetic operations, and A. Berget writes on "Les Méthodes et les Instruments du Géographe Voyageur." M. Zimmerman provides a review of half a century of European colonisation, and P. Girardin studies the subject of glaciation in the most recent geological epoch.

The first of these papers, that on Corsica, is an important contribution to the geography and geology of an island which has not been as closely studied as might be supposed from its accessibility. M. Perrier deals principally with the new measurement of the arc of the meridian of Quito which is in the hands of the Service géographique de l'Armée. It has been

in progress for nearly ten years, of which the field work alone occupied five, and its results are far from complete as yet.

The article on Peru by M. Guibeaud is a general geographical study, most useful in its way. First it provides a short survey of the country according to natural regions, and then passes on to a consideration of its chief economic, ethnographical, and political aspects. This article is particularly well illustrated. M. Zimmerman's study of colonisation is a careful collection of facts and theories, with copious references to authorities, which should form an excellent foundation for the investigation of this subject of world-importance. The volume, judged on French standards, is particularly well printed and produced. It is heavy and bulks large, and not a few readers would no doubt like to be able to obtain one or other of its component articles separately.

Notes on Dynamics. By Sir G. Greenhill. Second Edition. Pp. 221. (London: His Majesty's Stationery Office, 1909.) Price 3s.

THIS cheap issue from His Majesty's Stationery Office of a second edition of Sir George Greenhill's notes, prepared for the advanced class of the Ordnance College, Woolwich, will, we hope, become known to teachers and students. The title is modest, the book has never been advertised, and few people are aware of its great value and originality. It contains many excellent numerical examples, rather different from those which teachers usually set in elementary dynamics classes, but the reader will be even more interested in letting the author carry him occasionally into problems which are quite outside any ordinary curriculum. When he deals with problems which are dealt with in the text-books, he takes a way of his own in each case, and gives us new ideas. The end sections dealing with the stability of rigid bodies moving in fluids are of great interest.

J. P.

LETTERS TO THE EDITOR.

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The Temperature of the Upper Atmosphere.

LIKE Dr. Chree (NATURE, June 3), I do not think the term "stratosphere" a suitable one, and isothermal layer is obviously open to criticism. We should all be indebted to Dr. Chree if he would suggest a better and more accurate term. Isothermal column appears to me sufficiently accurate to describe the phenomena over a single station, but cannot be applied to the whole upper part of the atmosphere. Some single word implying the absence of vertical circulation is required.

There is no reasonable doubt that the daily temperature variation becomes insignificant at a height of 1 km., and hence one is apt to infer that it is negligible at 10 km.; but the observations are not sufficiently well distributed, and in my opinion the effect of solar radiation on the balloon, if not on the instruments, is too uncertain for us to speak positively about a daily variation at such heights. The two years' observations in England have shown no annual temperature variation above 10 km., and I do not believe that there is any definite change from summer to winter. It is probable that the mean monthly temperatures at 10 km. do not differ greatly either with latitude or with the season, although all the observations yet available at 15 km. show lower temperatures over the tropics than over temperate latitudes at that greater height.

I am glad to see that Dr. Chree does not assert that errors of $\pm 10^\circ$ F. are the usual thing. Probably few of those who use the instruments would assert that such an error might not occasionally occur. If the figures for